AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An apparatus for transmitting TFCI (Transport Format Combination Indicator) ~~TFCI~~ bits in a CDMA (Code Division Multiple Access) ~~CDMA~~ mobile communication system including a UE (User Equipment) and a Node B for transmitting packet data to the UE over a ~~the~~ first channel, encoding TFCI bits depending on information bits of the first channel and information bits of a second channel established to transmit the packet data over first channel, and transmitting the encoded TFCI bits over the second channel, comprising:

a first TFCI bit generator for creating first TFCI bits depending on information bits of the first channel;

a second TFCI bit generator for creating second TFCI bits depending on information bits of the second channel; and

an encoder for encoding the first TFCI bits and the second TFCI bits and puncturing the encoded first TFCI bits and second TFCI bits according to first and second puncturing positions respectively such that a remained number of encoded first TFCI bits to a remained number of encoded second TFCI bits is variable based upon the ratio of the first TFCI bits and the second TFCI bits.

2. (Original) The apparatus as claimed in claim 1, wherein the first channel is a downlink shared channel (DSCH) and the second channel is a dedicated channel (DCH).

3. (Original) The apparatus as claimed in claim 1, wherein the first puncturing positions are 1^{st}, 3^{rd}, 5^{th}, 6^{th}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th}, 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and second puncturing positions are 0^{th}, 2^{nd}, 8^{th}, 19^{th} and 20^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits is 1 and the number of second TFCI bits are 9.

4. (Original) The apparatus as claimed in claim 1, wherein the first puncturing positions are 3^{rd}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th},

25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and second puncturing positions are 1^{st}, 7^{th}, 13^{th}, 15^{th}, 20^{th}, 25^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 2 and the number of second TFCI bits are 8.

5. (Original) The apparatus as claimed in claim 1, wherein the first puncturing positions are 7^{th}, 8^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and second puncturing positions are 0^{th}, 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}, 7^{th}, 12^{th}, 18^{th}, 21^{st}, 24^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 3 and the number of second TFCI bits are 7.

6. (Original) The apparatus as claimed in claim 1, wherein the first puncturing positions are 0^{th}, 1^{st}, 2^{nd}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and second puncturing positions are 0^{th}, 7^{th}, 9^{th}, 11^{th}, 16^{th}, 19^{th}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 4 and the number of second TFCI bits are 6.

7. (Currently Amended) An apparatus for encoding TFCI (Transport Format Combination Indicator) bits in a CDMA mobile communication system including a UE and a Node B for transmitting packet data to the UE over ~~the~~ a first channel, encoding TFCI bits depending on information bits of the first channel and information bits of a second channel established to transmit the packet data over the first channel, and transmitting the encoded TFCI bits over the second channel, comprising:

a TFCI bit generator for creating the TFCI bits, the number of which is variable depending on an information bit ratio of the first channel to the second channel;

a code length information generator for generating code length information for setting a length of a codeword according to the information bit ratio;

a Walsh code generator for generating first to fifth basis Walsh codewords;

a sequence generator for generating an all-1 sequence;

a mask generator for generating first to fourth basis masks;

first to tenth multipliers for multiplying the TFCI bits by the first to fifth basis Walsh codewords, the all-1 sequence and the first to fourth basis masks, respectively;

an adder for adding outputs of the first to tenth multipliers; and

a puncturer for puncturing a codeword output from the adder according to the code length information.

8. (Original) The apparatus as claimed in claim 7, wherein the first channel is a downlink shared channel (DSCH) and the second channel is a dedicated channel (DCH).

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Currently Amended) An apparatus for receiving TFCI (Transport Format Combination Indicator) bits in a CDMA mobile communication system including a UE and a Node B for transmitting packet data to the UE over a first channel, encoding TFCI bits for the first channel into first TFCI symbols and TFCI bits for a ~~the~~ second channel established to transmit control information for the first channel into second TFCI symbols, and transmitting the first and second TFCI symbols over the second channel, comprising:

a demultiplexer for demultiplexing received TFCI symbols into a first TFCI symbols and

a second TFCI ~~secondTFCI~~ symbols; and

a decoder for inserting zeros in the first TFCI symbols and the second TFCI symbols at first and second predetermined positions respectively, and decoding the zero-inserted first and second TFCI symbols by using inverse fast Hadamard transform(IFHT).

16. (Original) The apparatus as claimed in claim 15, wherein the first channel is a downlink shared channel (DSCH) and the second channel is a dedicated channel (DCH).

17. (Original) The apparatus as claimed in claim 15, wherein the first positions are 1^{st}, 3^{rd}, 5^{th}, 6^{th}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th}, 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 0^{th}, 2^{nd}, 8^{th}, 19^{th} and 20^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits is 1 and the number of second TFCI bits are 9.

18. (Original) The apparatus as claimed in claim 15, wherein the first positions are 3^{rd}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 1^{st}, 7^{th}, 13^{th}, 15^{th}, 20^{th}, 25^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 2 and the number of second TFCI bits are 8.

19. (Original) The apparatus as claimed in claim 15, wherein the first positions are 7^{th}, 8^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 0^{th}, 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}, 7^{th}, 12^{th}, 18^{th}, 21^{st}, 24^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 3 and the number of second TFCI bits are 7.

20. (Original) The apparatus as claimed in claim 15, wherein the first positions are 0^{th}, 1^{st},

2^{nd}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 0^{th}, 7^{th}, 9^{th}, 11^{th}, 16^{th}, 19^{th}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 4 and the number of second TFCI bits are 6.

21. (Currently Amended) A method for transmitting TFCI (Transport Format Combination Indicator) bits in a CDMA mobile communication system including a UE and a Node B for transmitting packet data to the UE over a first channel, first and second encoded TFCI bits over a second channel established to transmit control ~~transmitcontrol~~ data for the first channel, comprising the steps of:

encoding a first TFCI bits representing a transport format combination of the first channel to generate first encoded symbols and a second TFCI bits representing a transport format combination of the second channel to generate second encoded symbols respectively; and

puncturing the first encoded symbols and the second encoded symbols according to first and second puncturing positions to generate the first encoded TFCI bits and the second encoded TFCI bits;

multiplexing the first encoded TFCI bits and the second encoded TFCI bits; and

transmitting the multiplexed encoded TFCI bits over the second channel.

22. (Original) The method as claimed in claim 21, wherein the first channel is a downlink shared channel (DSCH) and the second channel is a dedicated channel (DCH).

23. (Original) The apparatus as claimed in claim 21, wherein the first puncturing positions are 1^{st}, 3^{rd}, 5^{th}, 6^{th}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th}, 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second puncturing positions are 0^{th}, 2^{nd}, 8^{th}, 19^{th} and 20^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits is 1 and the number of second TFCI bits are 9.

24. (Original) The apparatus as claimed in claim 21, wherein the first puncturing positions are 3rd, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th and 31st coded symbols among a total of 32 encoded first symbols of 0th to 31st symbols and the second puncturing positions are 1st, 7th, 13th, 15th, 20th, 25th, 30th and 31st coded symbols among a total of 32 encoded second symbols of 0th to 31st symbols when the number of first TFCI bits are 2 and the number of second TFCI bits are 8.

25. (Original) The apparatus as claimed in claim 21, wherein the first puncturing positions are 7th, 8th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th and 31st coded symbols among a total of 32 encoded first symbols of 0th to 31st symbols and the second puncturing positions are 0th, 1st, 2nd, 3rd, 4th, 5th, 7th, 12th, 18th, 21st, 24th coded symbols among a total of 32 encoded second symbols of 0th to 31st symbols when the number of first TFCI bits are 3 and the number of second TFCI bits are 7.

26. (Original) The apparatus as claimed in claim 21, wherein the first puncturing positions are 0th, 1st, 2nd, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th and 31st coded symbols among a total of 32 encoded first symbols of 0th to 31st symbols and the second puncturing positions are 0th, 7th, 9th, 11th, 16th, 19th, 24th, 25th, 26th, 27th, 28th, 29th, 30th and 31st coded symbols among a total of 32 encoded second symbols of 0th to 31st symbols when the number of first TFCI bits are 4 and the number of second TFCI bits are 6.

27. (Original) A method for receiving TFCI (Transport Format Combination Indicator) bits in a CDMA mobile communication system including a UE and a Node B for transmitting packet data to the UE over a first channel, first and second encoded TFCI bits over a second channel established to transmit control data for the first channel, comprising the steps of:

demultiplexing received encoded TFCI bits into the first encoded TFCI bits and the second encoded TFCI bits;

inserting zeros in the first encoded TFCI bits and second encoded TFCI bits at first and second predetermined positions respectively; and

decoding the zero-inserted first and second TFCI bits.

28. (Original) The method as claimed in claim 27, wherein the first channel is a downlink shared channel (DSCH) and the second channel is a dedicated channel (DCH).

29. (Original) The apparatus as claimed in claim 27, wherein the first positions are 1^{st}, 3^{rd}, 5^{th}, 6^{th}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th}, 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 0^{th}, 2^{nd}, 8^{th}, 19^{th} and 20^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits is 1 and the number of second TFCI bits are 9.

30. (Original) The apparatus as claimed in claim 27, wherein the first positions are 3^{rd}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 1^{st}, 7^{th}, 13^{th}, 15^{th}, 20^{th}, 25^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 2 and the number of second TFCI bits are 8.

31. (Original) The apparatus as claimed in claim 27, wherein the first positions are 7^{th}, 8^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 0^{th}, 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}, 7^{th}, 12^{th}, 18^{th}, 21^{st}, 24^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 3 and the number of second TFCI bits are 7.

32. (Original) The apparatus as claimed in claim 27, wherein the first positions are 0^{th}, 1^{st}, 2^{nd}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second positions are 0^{th}, 7^{th}, 9^{th}, 11^{th}, 16^{th}, 19^{th}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of

first TFCI bits are 4 and the number of second TFCI bits are 6.

33. (Currently Amended) A method for encoding TFCI bits for a first channel and TFCI (Transport Format Combination Indicator) bits for a second channel depending on an information bits ratio of the first channel to the second channel first channel TFCI and the second channel TFCI in a CDMA mobile communication system, comprising the steps of:

creating m first TFCI bits based on data of the first channel and n second TFCI bits based on data of the second channel;

encoding the first TFCI bits and puncturing the encoded first symbols according to a first puncturing positions of the first channel to generate first encoded TFCI symbols;

encoding the second TFCI bits, and puncturing the encoded second symbols according to a second puncturing positions of the second channel to generate second encoded TFCI symbols; and

multiplexing the first encoded TFCI symbols and the second encoded TFCI symbols so ~~symbolsso~~ as to uniformly distribute the first and second TFCI symbols.

34. (Original) The apparatus as claimed in claim 33, wherein the first puncturing positions are 1^{st}, 3^{rd}, 5^{th}, 6^{th}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th}, 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second puncturing positions are 0^{th}, 2^{nd}, 8^{th}, 19^{th} and 20^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits is 1 and the number of second TFCI bits are 9.

35. (Original) The apparatus as claimed in claim 33, wherein the first puncturing positions are 3^{rd}, 7^{th}, 8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second puncturing positions are 1^{st}, 7^{th}, 13^{th}, 15^{th}, 20^{th}, 25^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 2 and the number of second TFCI bits are 8.

36. (Original) The apparatus as claimed in claim 33, wherein the first puncturing positions are 7^{th}, 8^{th}, 11^{th}, 12^{th}, 13^{th}, 14^{th}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second puncturing positions are 0^{th}, 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, 5^{th}, 7^{th}, 12^{th}, 18^{th}, 21^{st}, 24^{th} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 3 and the number of second TFCI bits are 7.

37. (Original) The apparatus as claimed in claim 33, wherein the first puncturing positions are 0^{th}, 1^{st}, 2^{nd}, 15^{th}, 16^{th}, 17^{th}, 18^{th}, 19^{th}, 20^{th}, 21^{st}, 22^{nd}, 23^{rd}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded first symbols of 0^{th} to 31^{st} symbols and the second puncturing positions are 0^{th}, 7^{th}, 9^{th}, 11^{th}, 16^{th}, 19^{th}, 24^{th}, 25^{th}, 26^{th}, 27^{th}, 28^{th}, 29^{th}, 30^{th} and 31^{st} coded symbols among a total of 32 encoded second symbols of 0^{th} to 31^{st} symbols when the number of first TFCI bits are 4 and the number of second TFCI bits are 6.